



1/12

FLIP CHIP COMPONENTS

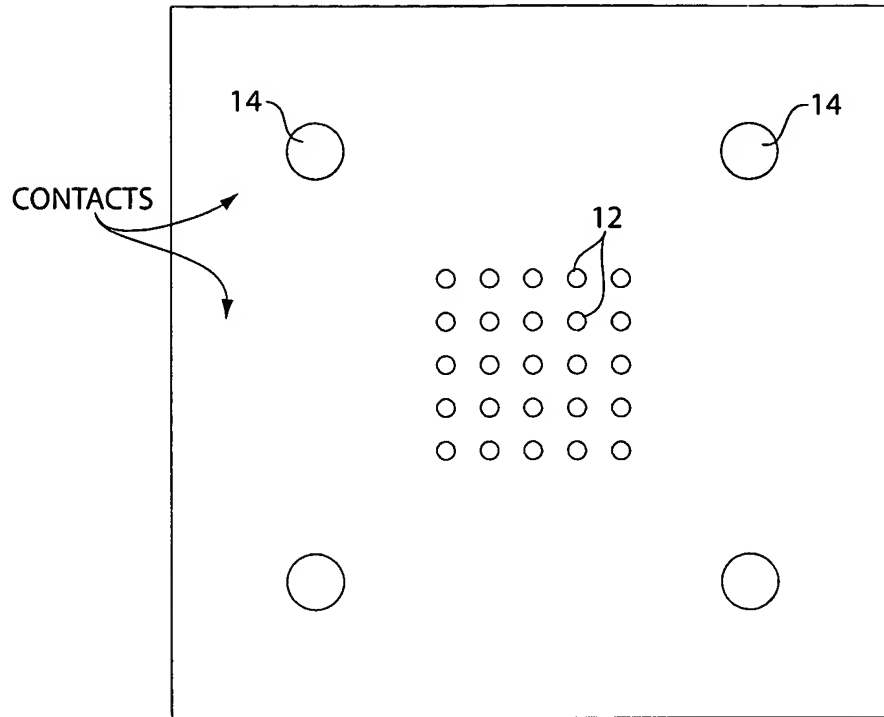


Fig. 1A

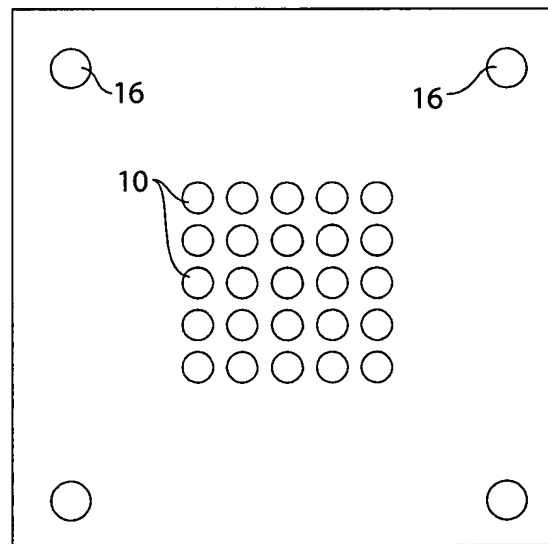


Fig. 1B



2/12

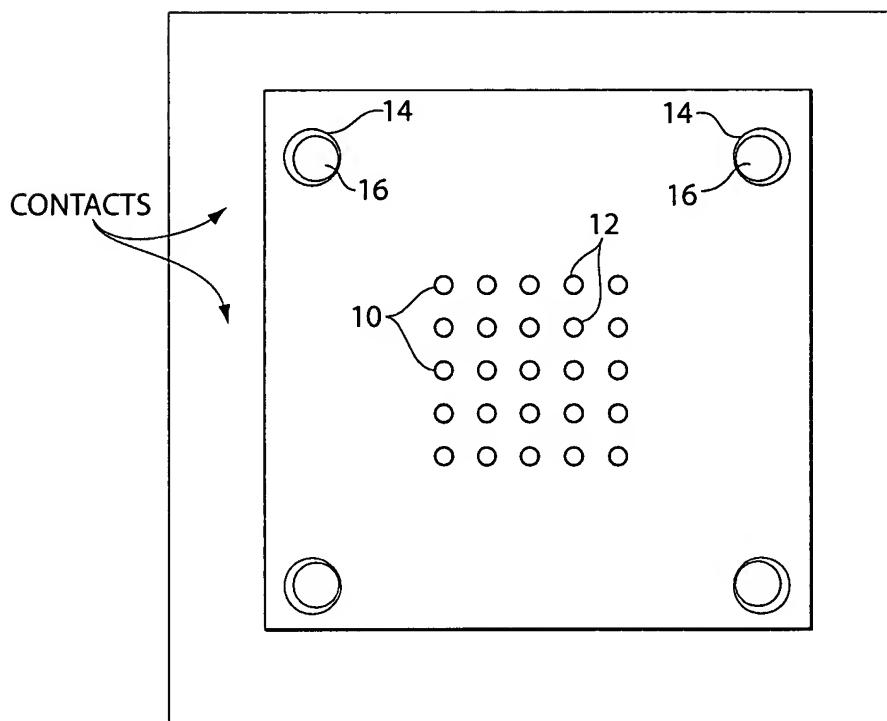


Fig. 2A



3/12

FLIP CHIP ASSEMBLY DRAWING

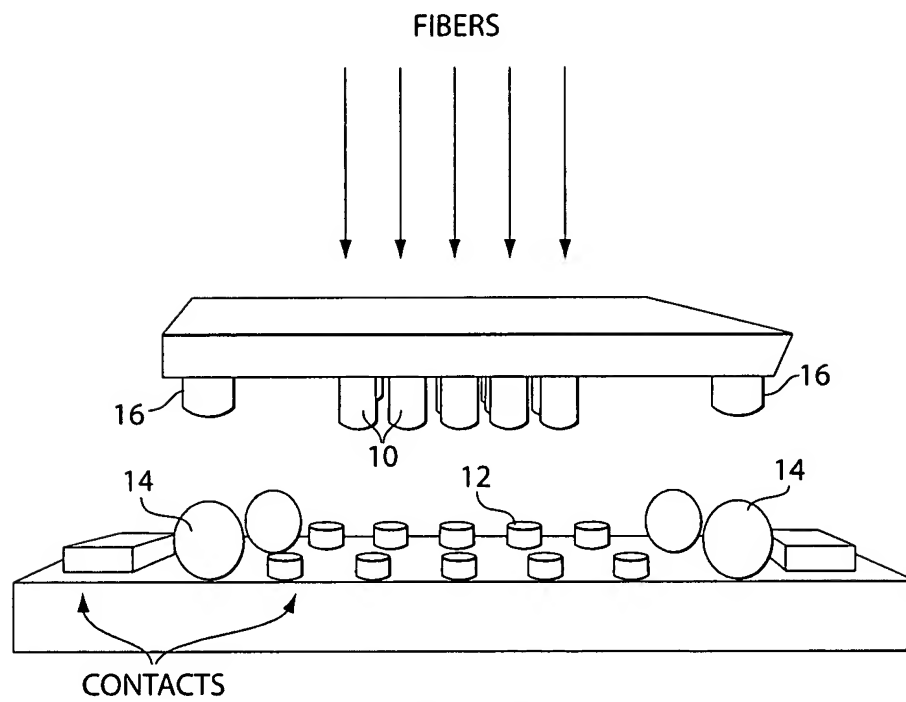
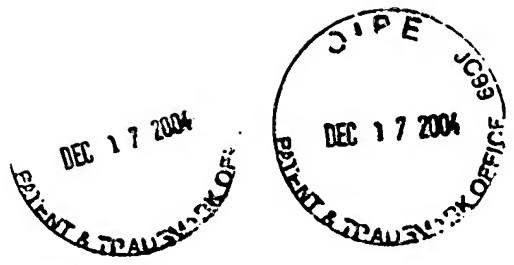


Fig. 2B



METAL MICRONEEDLE FABRICATION PROCESS

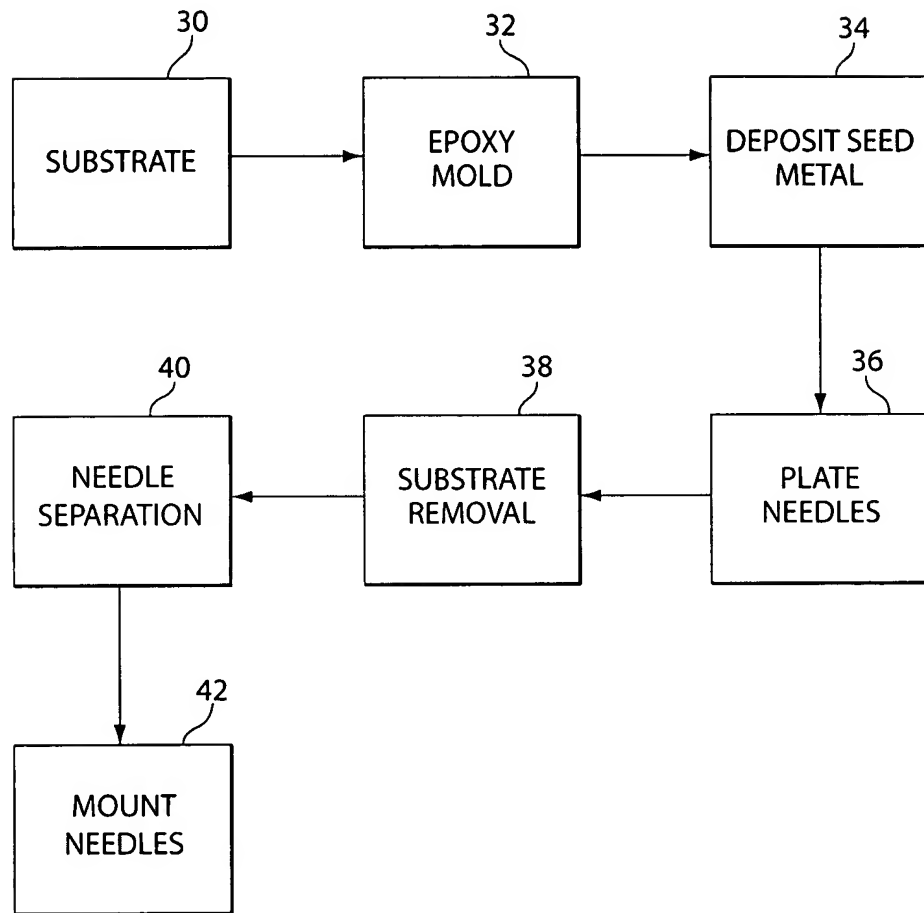


Fig. 3A



5/12

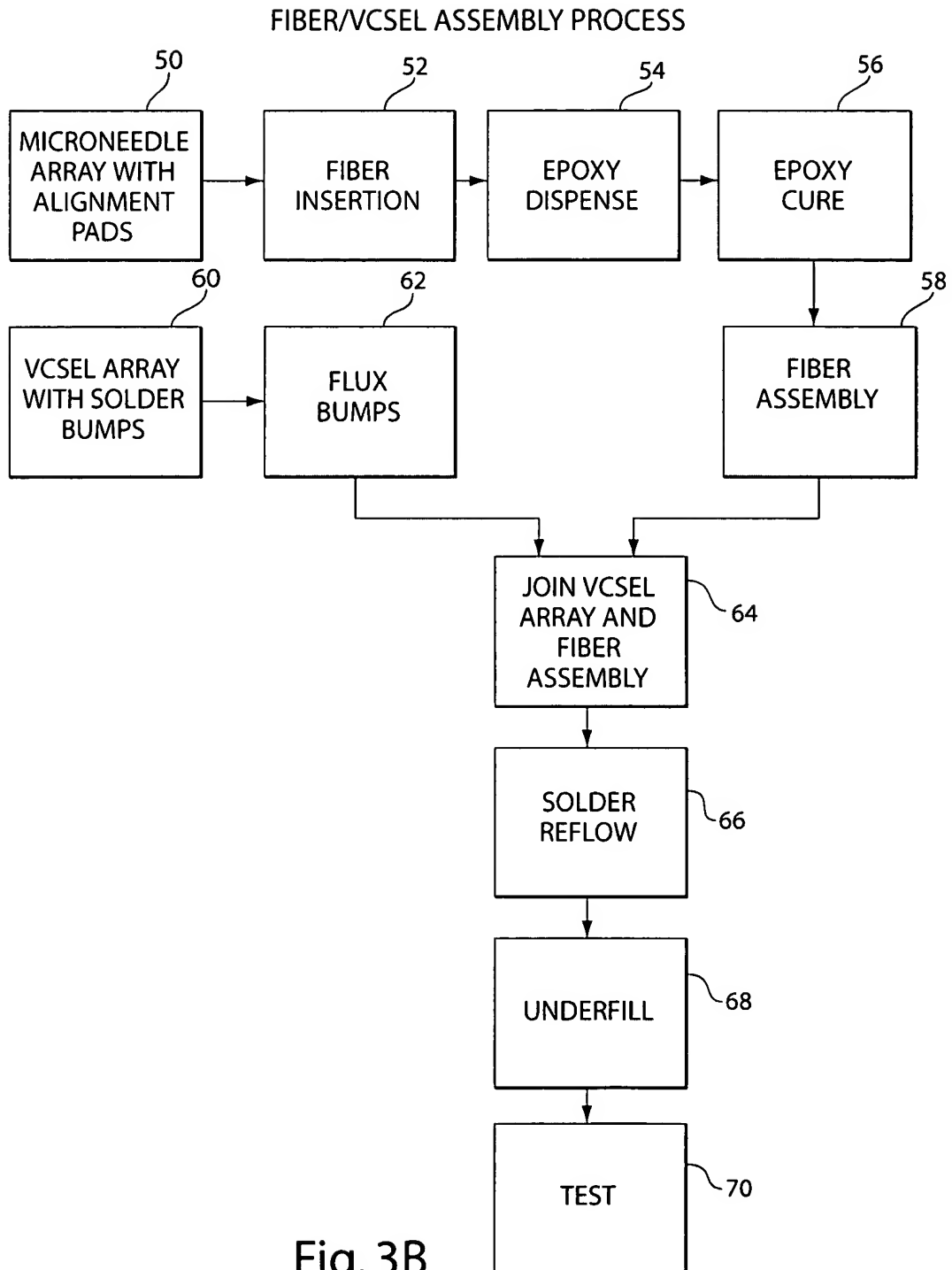


Fig. 3B



6/12

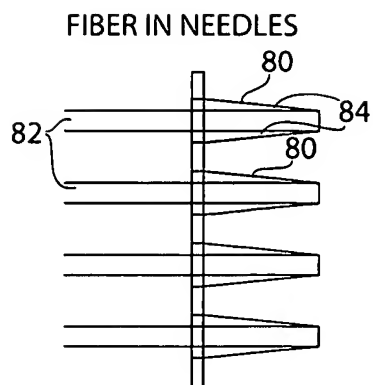


Fig. 4A

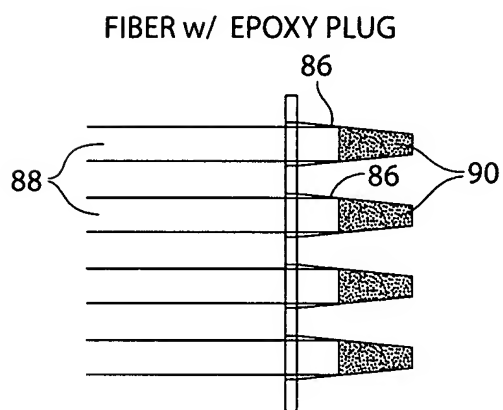


Fig. 4B

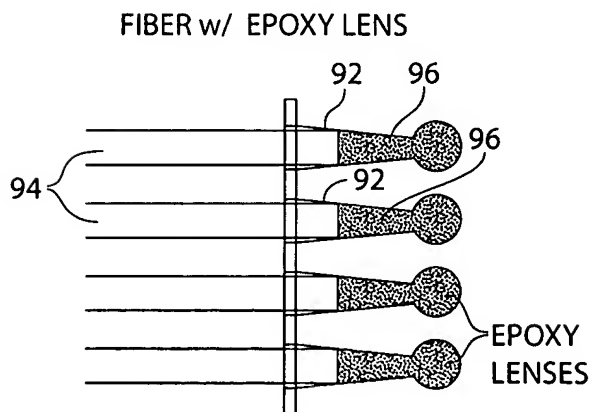


Fig. 4C



7/12

FIBER w/ GRADED EPOXY LENS

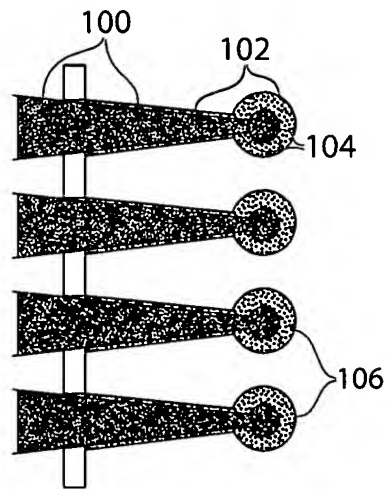


Fig. 5

MICRO-EXTRUSION

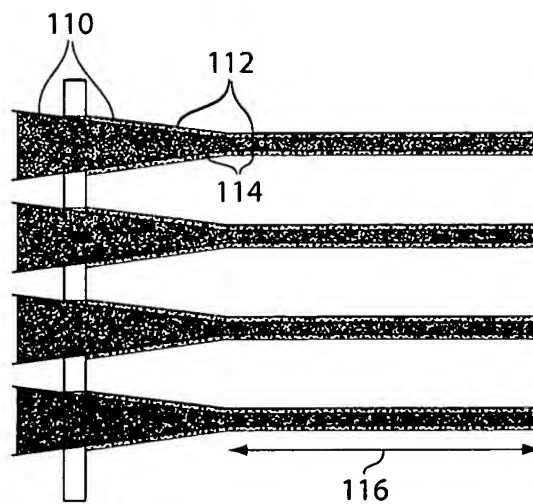


Fig. 6



8/12

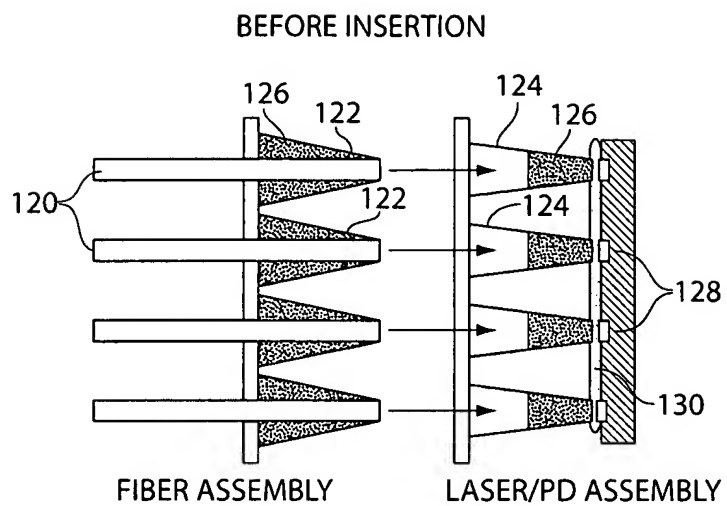


Fig. 7A

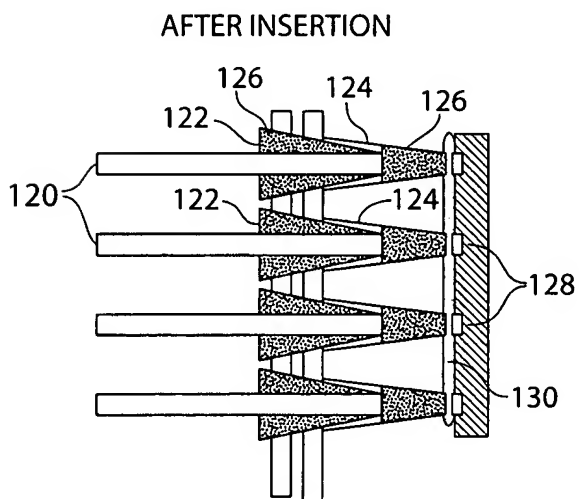


Fig. 7B

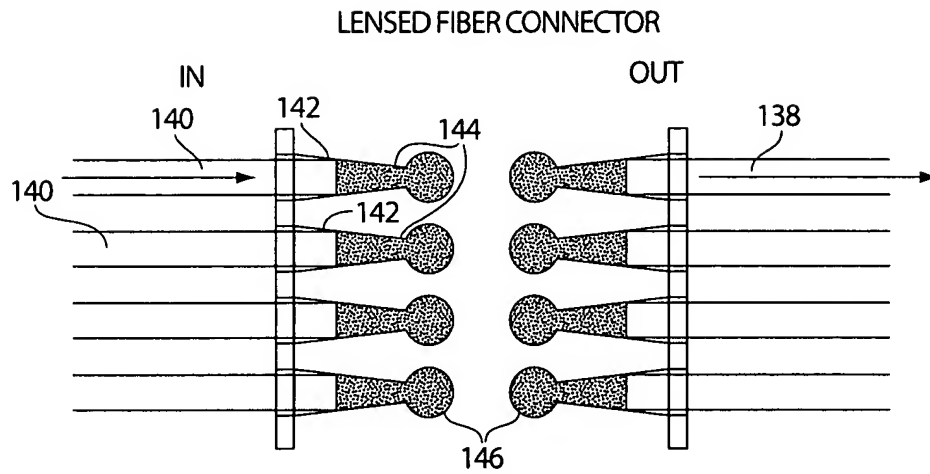


Fig.8

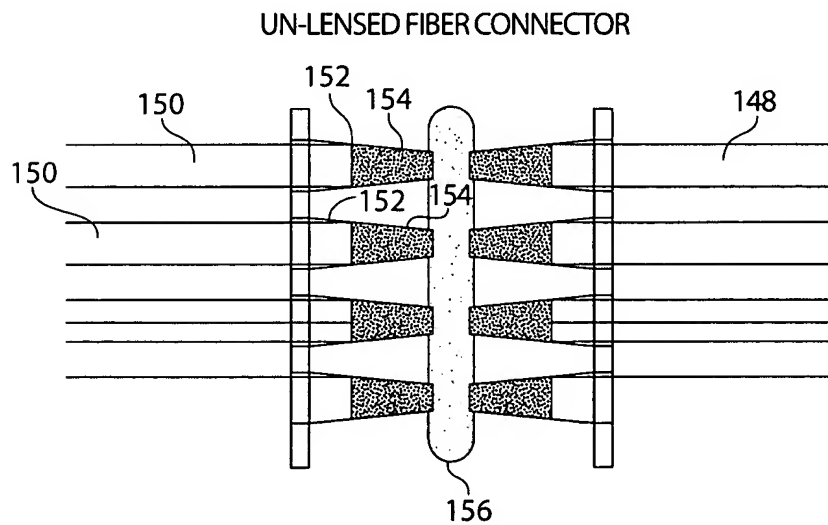


Fig.9



10/12

LENSED FIBER CONNECTOR w/ ALIGNMENT SPACER

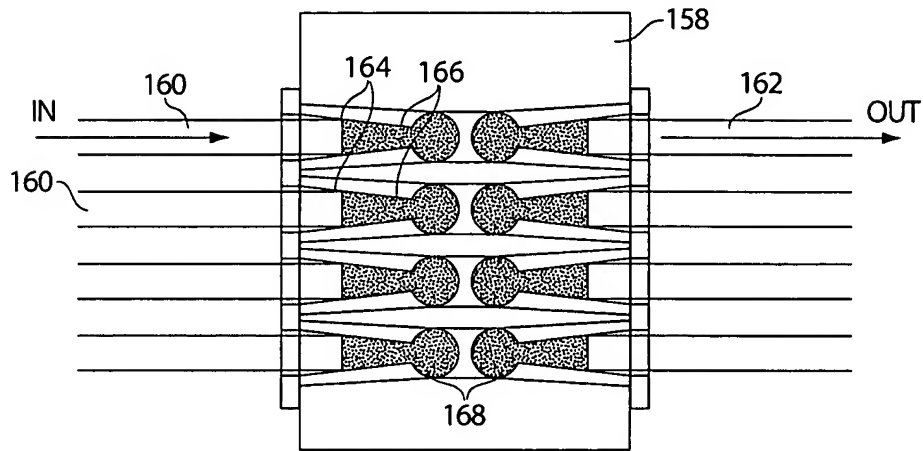


Fig.10

UN-LENSED FIBER CONNECTOR w/ ALIGNMENT SPACER

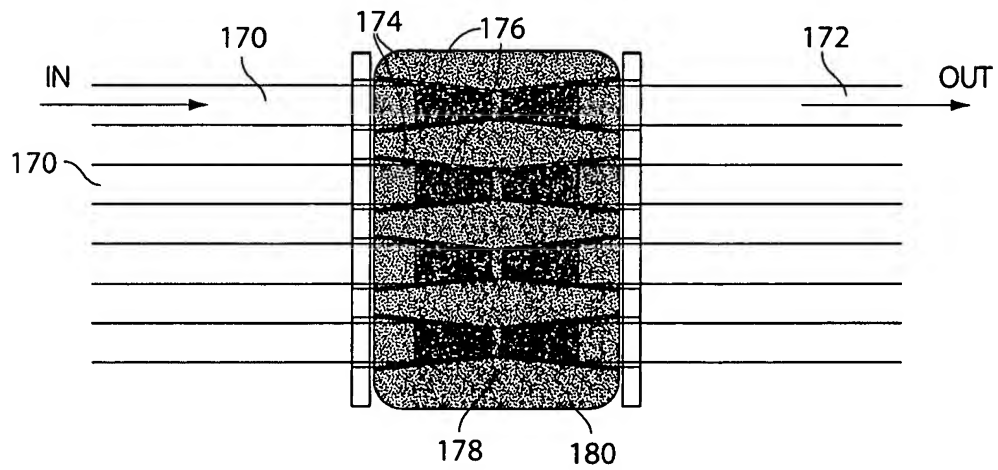


Fig.11



11/12

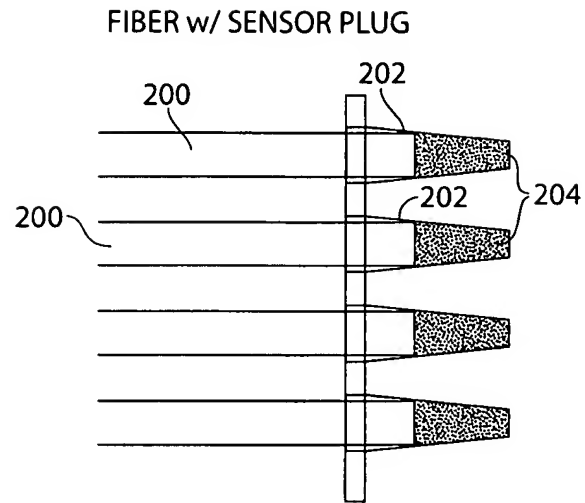


Fig. 12A

FIBER w/ LENS-SHAPED SENSOR ELEMENT

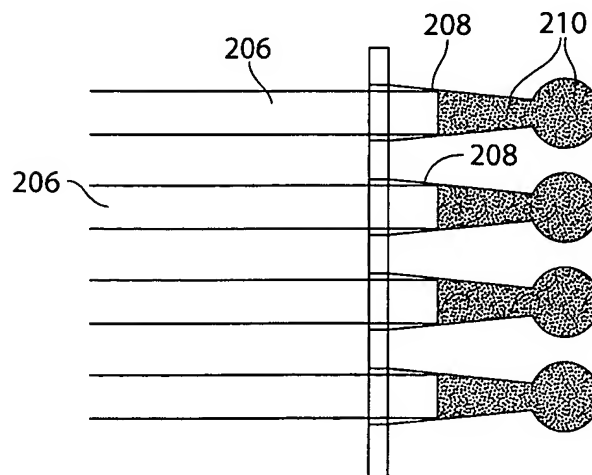


Fig. 12B



12/12

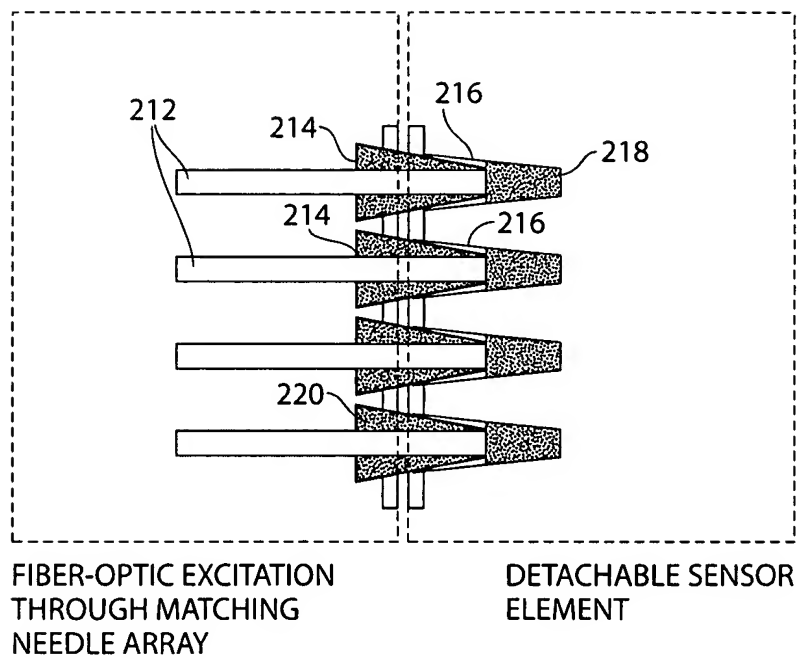


Fig. 12C